

## Demag Dedrive Compact STO frequency inverters

Solutions to meet specific drive requirements – up to 110 kW motor output



## For perfect motor control



Do you want excellent operating characteristics and maximum reliability? You can select a drive solution to meet your specific requirements precisely using Demag DEDRIVE Compact STO frequency inverters. Seven sizes are available for motor outputs up to 110 kW.

### The multitalent for versatile applications

DEDRIVE Compact STO units can be used, for example:

- to adapt processes exactly
- to adjust variable speeds
- to reduce loads on motors and gearboxes
- to transport goods gently
- to protect mechanical structures
- to limit starting currents
- to use motors more efficiently (87 Hz operation).

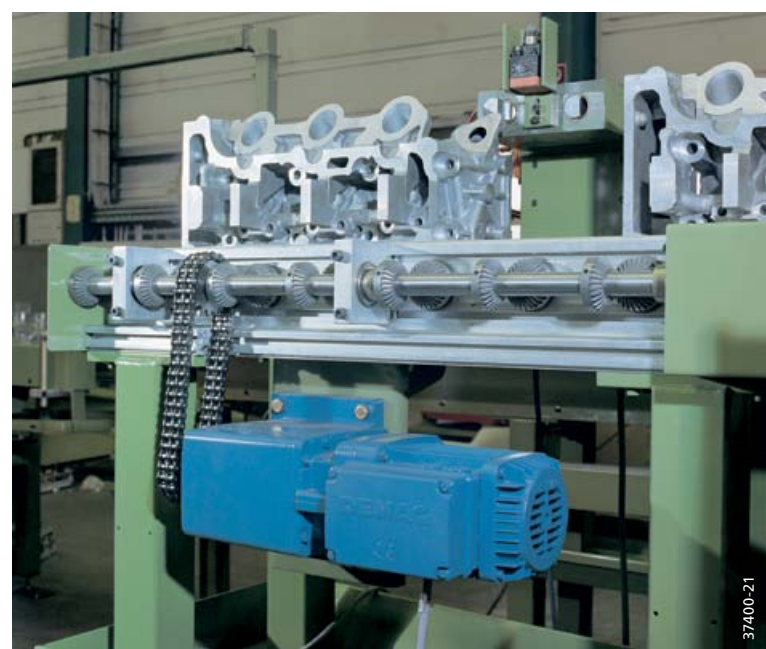
### Powerhouse for high efficiency

DEDRIVE Compact STO makes your drive solution more efficient:

- less wear and a lower maintenance requirement, as only electrical braking is usually necessary
- greater performance for a given motor frame size thanks to higher speeds at constant torque
- reduced load on the power supply network and mechanical components compared to line-fed drives thanks to lower start-up currents and acceleration torques.



Crane loads can be positioned quickly and accurately, since load sway is virtually eliminated



Roller conveyor operating at precisely adjusted speed

### Smooth operation for gentle handling

Simple and precise operation with a Demag inverter provides a number of benefits:

- travel characteristics independent of the load
- gentle handling thanks to smooth acceleration and deceleration
- reduction of the load sway that typically occurs in crane operation
- high travelling speed and positioning accuracy thanks to large speed range with fine control.

### You benefit from our standard features

Dedrive Compact STO frequency inverters offer outstanding functionality and maximum reliability for lifting, lowering, turning, travel or slewing motions.

### Integrated safety

Peace of mind for your staff and safety for your equipment with the Safe Torque Off (STO) function offered by Dedrive Compact STO.

### Rugged design

Dedrive Compact STO is highly resistant to shaking and vibration, even under arduous operating conditions. At the same time, it can protect your installation from harmful vibration by suppressing specific frequency ranges.

### Commissioning at the push of a button

The unit can be put into service quickly and easily. When the brake is applied, the motor's parameters can be identified fully automatically as soon as the rating plate information is entered.

### Adaptability for specific solutions

Dedrive Compact STO frequency inverters can be systematically configured to meet your needs by programming the specific parameters for the given application.



Four-wheel trolley controlled by a frequency inverter for smoothly moving blocks of aluminium



Sensitive loads can be gently picked up and precisely set down

# Four types of protection – for motor shaft output starting at 0.75 kW

## Protection against overload

Dedrive Compact STO provides drives with performance reserves of 150% for 60 seconds and 200% for 10 seconds. This means that drives can be rated more cost-effectively.

## Protection against unexpected start-up

The integrated STO (Safe Torque Off) safety function to EN 61800-5-2 switches the drive torque off and prevents any unexpected start-up by the drive.

## Protection for the supply system against conducted interference

Dedrive Compact STO units up to size 3 are supplied with line filters as standard and protect the supply system against conducted interference as laid down in relevant regulations.

## Protection against incorrect diagnosis

Comprehensive actual-value displays facilitate exact process monitoring – possible errors are reported in good time and can be prevented before they occur.



40731-1

Removable control unit



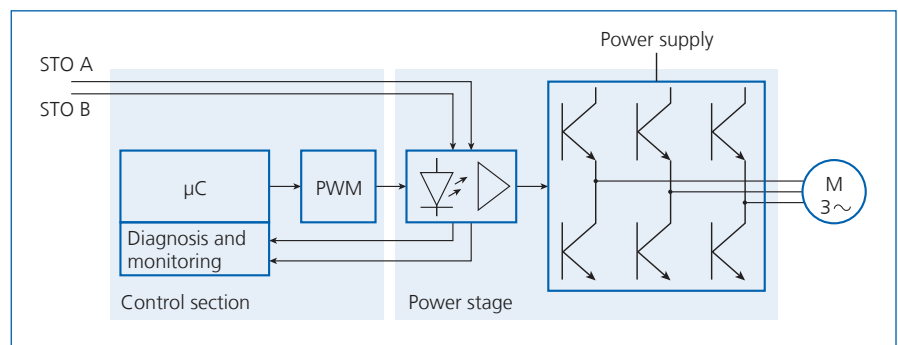
40731-3

Profibus module



40731-4

Expansion module

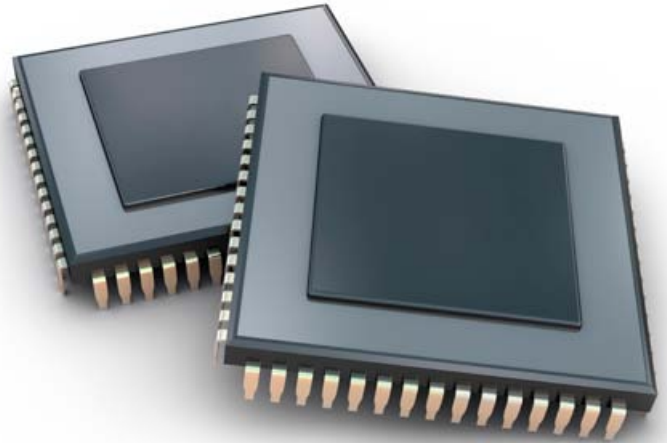


Safe Torque Off: control of the power stage is reliably suppressed while the drive remains connected to the power supply

# The complete package – hardware and software overview

## Hardware

- Output current: 2.4 – 210 A
- Nominal voltage range: 380 – 480 V (+10/-15%)
- Overload capability: factor of 1.5 for 60 seconds; up to factor of 2 for 10 seconds (except for DIC-4-040)
- Short-circuit/earth-fault resistant motor circuit output
- CE and cULus listed
- System bus for master/slave applications
- Integrated line filter up to size 3
- Integrated brake chopper
- Plug-in control terminals
- Evaluation of motor temperature detector
- STO – Safe Torque Off to EN 61800-5-2 meets the requirements of Cat. 3, PL d to EN ISO 13849-1 and SIL 2 to IEC 61508
- External 24 V supply



## Hardware options

- Control unit for parameter programming and commissioning
- Communications modules for field bus network
- Universal module to add control inputs and outputs, as well as PTC thermistor and speed encoder evaluation
- Parcom Compact PC software for convenient parameter programming and diagnosis
- Filters, line reactors, braking resistors

## Software

- Control of cylindrical and conical-rotor motors
- Parameter identification when motor is at standstill
- Field-oriented control with/without speed encoder for highly dynamic speed control
- Speed monitoring
- Rounding function for smooth acceleration
- Four switchable data sets (e.g. control, ramp or motor switchover)
- Control types: setpoint memory (SOSP), setpoint stages (SOST, 2 to 8-stage) and analogue; each with pre-programmable input assignment
- Motor potentiometer via control unit
- Brake release monitoring
- Programmable joystick characteristics
- Load-dependent speed for hoist operation with field weakening (ProHub)
- Load spectrum calculation
- Freely programmable logic functions with digital and analogue links
- Speed or torque control freely selectable
- Simple positioning function via defined position path
- Master/slave function, electronic gearbox and closed-loop control
- Average and peak value memory for various process variables
- Comprehensive diagnosis functions
- Positioning – 32 data sets for destination positions and travel profiles

## Complete solutions for travel and lifting applications – engineering requirement reduced to a minimum

Demag application modules enable you to benefit from considerably reduced engineering costs. These complete solutions contain precisely matching components which incorporate our industrial drive and materials handling expertise.

### Your direct benefits

- All special requirements of travel and hoist drives are catered for
- Reduced planning requirement
- Reliable cost calculation
- Demag control standard
- Fast and reliable connection (only power supply, motor and control lines)
- Safe and reliable functionality thanks to integrated Demag safety control with safety functions to EN 61800-5-2

### All components ready installed and wired

Application modules with Dedrive Compact STO frequency inverters contain all necessary components ready installed and wired on an assembly panel. The power and control line terminals are ready for connection. The application module is pre-programmed. When it has been connected, only a motor identification run needs to be performed. The module is supplied either already fitted in a high-quality switchgear cabinet or as a separate unit, according to your needs.

### Three variants for a wide variety of requirements

- Standard applications
- Extended standard
- Customer-specific applications

Careful handling of steel strip in a coil store



### Standard applications – e.g. for gentle load movements

If you want to move loads smoothly and gently, the standard applications provide you with the right solution for your travel or lifting requirements.

Possible control methods:

- analogue bipolar
- analogue unipolar (evaluation of pulse-width modulated control signals possible by means of additional PWM/analogue converter)
- SOST reference value steps
- SOSP reference value memory
- CAN field bus control
- Profibus DP field bus control.

### Extended standard – e.g. to synchronise motions

Our product range also includes matching application modules if you need functionality beyond standard application requirements, such as an electronic gearbox as part of a master/slave function, which enables drives to be synchronised.

Two hoist drives can be synchronised for handling long materials, for example. This ensures that the load is always held in balance.

### Applications to meet specific customer needs – braking energy recovery

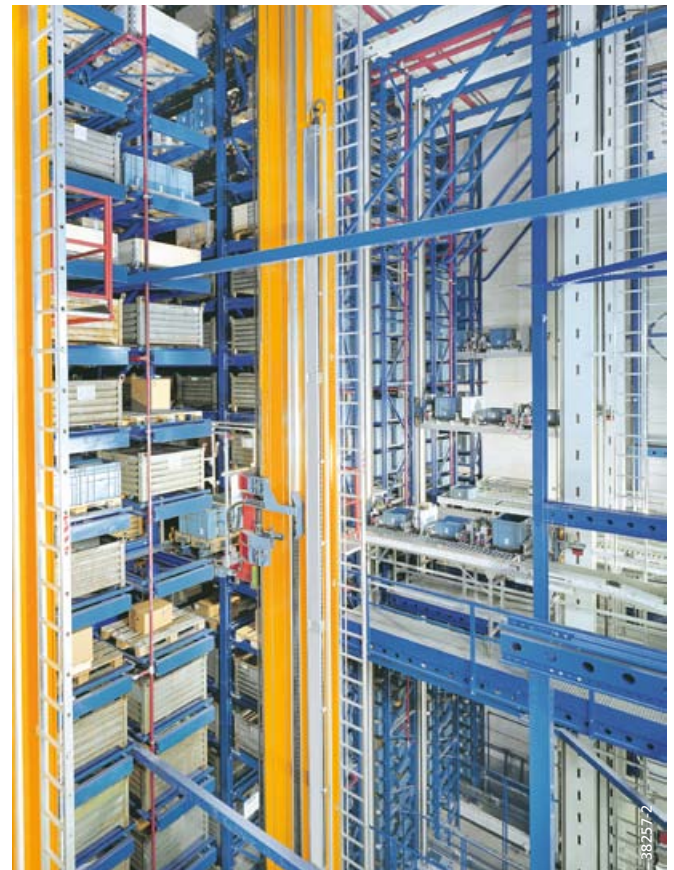
Our further application solutions can be specially configured to meet your specific needs.

Application modules are also available with power recovery units. They enable the high energy that is generated when hoist units brake to be fed back into the line power supply.

Master/slave function to synchronise motion sequences of two hoist units



Braking energy recovery for storage/retrieval machines



# Application modules for decentralised installations – protection even under extreme conditions

Dedrive Compact STO frequency inverters are also available as complete solutions in an IP 54 enclosure for inverter applications that demand protection against dust and splash water. They are also ideally suited for decentralised installations – even in arduous environments.

## Design

Thanks to installation in a switchgear cabinet, additional components or modules can be added to extend the range of functions. Dedrive Compact STO heat sinks are located on the rear of the switchgear cabinet. This enables heat generated in the inverter power stage to be dissipated direct to the surroundings.

## Basic version

The basic version comprises:

- switchgear cabinet with IP54 enclosure
- Dedrive Compact STO of cold plate design, with communication module option
- heat sink on the rear of the enclosure
- line filter (up to 14 A internal, for 25 A external) for Class A, Group 1 with max. 10 m motor cable
- braking resistor for standard travel applications
- GU brake module for brakes up to size B050 for the Z motor range.

## Extensions

- Line contactor
- Mini control system with
  - brake release and wear indicator
  - further warning messages
  - inputs for 115 V/230 V control signals.
- Braking resistor for
  - travel applications with higher loads
  - lifting applications.
- Plug connector

## Optional extensions for:

- Z cylindrical-rotor motors
  - second GU brake module for double motor operation
  - brake contactor for multi-motor operation or brakes larger than size B050.
- KB conical-rotor brake motors
  - motor contactor.







Operation in a foundry: Dedrive Compact STO offers reliable performance under even the most arduous conditions

### Complete solution with IP54 enclosure

Component	Type	Output current [A]	Housing dimensions* WxHxD [mm]
1	DIC-4-002-P	2.4	300x400x290
2	DIC-4-007-P	7.8	300x400x290
3	DIC-4-014-P	14	300x400x290
4	DIC-4-025-P	25	300x400x290

\* Heat sink on the rear of the enclosure

# At a glance – Dedrive Compact STO frequency inverter technical data

Size		1			2			3	
Current code	DIC-4-...-E-0000-03	002	004	006	007	009	014	017	
<b>Motor-side output</b>									
Output current [A]		2.4	3.8	5.8	7.8	9.0	14	16.5	
Output voltage [V]		3x0 ... line voltage							
Overload capability		1.5 for 60seconds; 2.0 for 10seconds							
Protection		Short circuit/earth fault res.							
Rotary field frequency [Hz]		0 ... 300 depending on the modulation frequency							
Switching frequency [kHz]		2 ... 16							
<b>Line-side input</b>									
Line current <sup>2)</sup> [A]	3 ~/PE	2.4	3.3 <sup>1)</sup>	5.8	6.4 <sup>1)</sup>	7.8 <sup>1)</sup>	14.2	14.5 <sup>1)</sup>	
Line voltage [V]		3x380 to 480 +10/-15%							
Line frequency [Hz]		50/60 +/-10%							
Fuse links [A]	3 ~/PE	6			10			16	20
<b>Mechanical</b>									
Dimensions HxWxD [mm]		190x60x180			250x60x180				
Weight (approx.) [kg]		1.3			1.7			2.7	
Type of enclosure		IP20 (EN60529)							
Connection terminals [mm <sup>2</sup> ]		0.2 ... 1.5							
Mounting arrangement		vertical							

1) Line reactor required for a duty factor > 60%

2) Mains current with a relative mains impedance of 1%

DIC-4-002 to DIC-4-120 frequency inverters



39584-5

4			5		6			7		
025	032	040	045	060	075	090	120	150	180	210
25	32	40	45	60	75	90	120	150	180	210
3x0 ... line voltage										
1.4 for 60sec.; 1.6 for 10sec.		1.5 for 60seconds; 2.0 for 10seconds					1.5 for 60seconds; 1.8 for 10seconds			
Short circuit/earth-fault resistant										
0 ... 300 depending on the modulation frequency										
2 ... 8										
26	28.2 <sup>1)</sup>	35.6 <sup>1)</sup>	52	58 <sup>1)</sup>	72	86 <sup>1)</sup>	116 <sup>1)</sup>	143 <sup>1)</sup>	172 <sup>1)</sup>	208 <sup>1)</sup>
3x380 to 480 +10/-15%										
50/60 +/-10%										
35	50	63	80	100	125	160	200	250		
250x125x200			250x200x260		400x275x265			510x412x351		
3.8			8.9		21.2			45		48
IP20 (EN60529)										
0.2 ... 16			1.5 ... 25		... 70			... 2x95 (stud bolts)		
vertical										



## Designer tool for frequency inverters – convenient project engineering

You can quickly configure your Demag frequency inverters online with our Designer tool. Quickly:

- select and specify your inverters based on technical data
- specify matching braking resistors
- specify line reactors and line filters
- select options and accessories.

[www.di.demag-designer.com](http://www.di.demag-designer.com)

## Complete Demag industrial drive solutions – from wheels to inverters

### Geared motors

- Helical geared motors from 90 to 5,800 Nm
- Angular geared motors from 120 to 12,000 Nm
- Offset geared motors from 130 to 11,500 Nm

With cylindrical-rotor motors from 0.18 to 45 kW

### Conical-rotor brake motors

- For increased requirements such as extremely high switching frequencies and braking operation for outputs from 0.37 to 42 kW

### Microspeed drives

- With conical-rotor motors
- For high speed ranges and positioning with high stopping accuracy
- Speed ratios up to 500 : 1

### Travel unit components

- Modular systems for elements in materials handling installations and mechanical engineering applications without the need for any additional design work and production
- Wheel blocks, travel drives and wheel sets ready for installation for wheel loads up to 60 tonnes

### Frequency inverters

- Dedrive Compact STO and Dedrive Pro for AC drives with motor shaft outputs up to 560 kW
- Control of cylindrical and conical-rotor motors as single or groups of drives
- Current loads from 2.4 to 210 A and 4.2 to 544 A respectively

### Power supply

- To supply mobile consumers with electric power
- Rated for currents up to 200 A (60% CDF)
- Fitted with up to 7 conductors, as required